

## Remarks on the genus *Delgamma* Moore (Lepidoptera, Noctuidae), with description of a new species from South East Asia

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**Abstract** *Delgamma flaviae* sp. nov., a species allied to *Delgamma pangonia* (Guenée), is described from Peninsular Malaysia on the basis of sharp differences in wing pattern and genitalia.

**Key words** *Delgamma*, Noctuidae, Catocalinae, new species, South East Asia.

### Introduction

Two species are currently recognised within the genus *Delgamma* Moore, 1885 (*cf.* Poole, 1989), namely *D. pangonia* (Guenée, 1852) (= *Naxia calorifica* Walker, 1858; = *Delgamma sanctae* A. E. Prout, 1927) and *D. lilacea* (Bethune-Baker, 1906).

*Delgamma pangonia* is a well-known species occurring in western tropical Africa and over most of the Indo-Australian tropics from India and Sri Lanka to Australia (Barlow, 1982; Edwards, 1996), while *D. lilacea* is seemingly restricted to the Papuan region (Bethune-Baker, 1906).

*Delgamma pangonia* is sexually dimorphic, the forewing of the male being more slender, the hindwing smaller, more rounded and bearing an elliptical loosely scaled area. This latter extends from cell base to nearly two-thirds beyond cell of a remarkably swollen interspace  $M_1-M_2$ , is longitudinally bisected by a well marked vein-like median fold, and is particularly sharp beyond the cell, where it gives origin to a nearly naked hyaline depression. This area exactly coincides with a patch of modified scales (probably androconia) situated below  $1A+2A$  on the verso surface of the forewing and likely serves to protect them while in the natural position.

While sexing Indo-Australian specimens from the “Catocalinae *s. l.*” assemblage stored in the Museum of Zoology of Rome, the technique of checking frenular bristles was being followed as a routine. Surprisingly, a *pangonia*-like specimen of *Delgamma* was found with a fully feminine wing shape and venation, which in reality was a male. Owing to the collaboration of Martin Honey, further six specimens corresponding with this example were traced in the collections of the Natural History Museum of London. Study of this material revealed that it relates to a new species which is here described. It has to be noticed that both *D. pangonia* and the new species share a very similar pattern, while *D. lilacea* is a different looking species. This one is of uniform flesh-pink colour and almost devoid of markings, with the exception of straight postmedials; moreover, in the male sex, wing margins are so straight and tornal angles so clear-cut as to produce distinctly triangular forewings and trapezoidal hindwings. Abbreviations for material depositories are as follows.

MCZ: Museo Civico di Zoologia, Rome.

NHM: Natural History Museum, London.

## Description of the new species

### *Delgamma flaviae* sp. nov. (Figs 1-2, 5-6, 9)

**Diagnosis.** A species allied to *Delgamma pangonia* (Guenée, 1852) characterised by general reduction of sexual dimorphism and obliteration of dark apical spots of forewing (Figs 1-4). Male is devoid of secondary sexual traits which are characteristic of *pangonia*, such as a patch of modified scales below 1A+2A on verso surface of forewing and a loosely scaled area beyond the cell in the swollen interspace  $M_1-M_2$  of the hindwing. Male genitalia differ from those of *pangonia* by a longer and thinner uncus, shorter and distally tapering costal process, incisure of superior margin of juxta not U-shaped, aedeagus without dentate carina and bearing distally a conspicuous thumb-like projection, a larger vesica with a broad superior sack and different configuration (Figs 5-8). Female genitalia differ by the ostium bursae not being surrounded by sclerotizations and the posterior sclerotized part of the ductus bursae being barrel-shaped, not funnel-shaped as in *pangonia*. Sternum A7 of the female is only barely concave at middle, without the deep incisure occurring in *pangonia* (Figs 9-10).

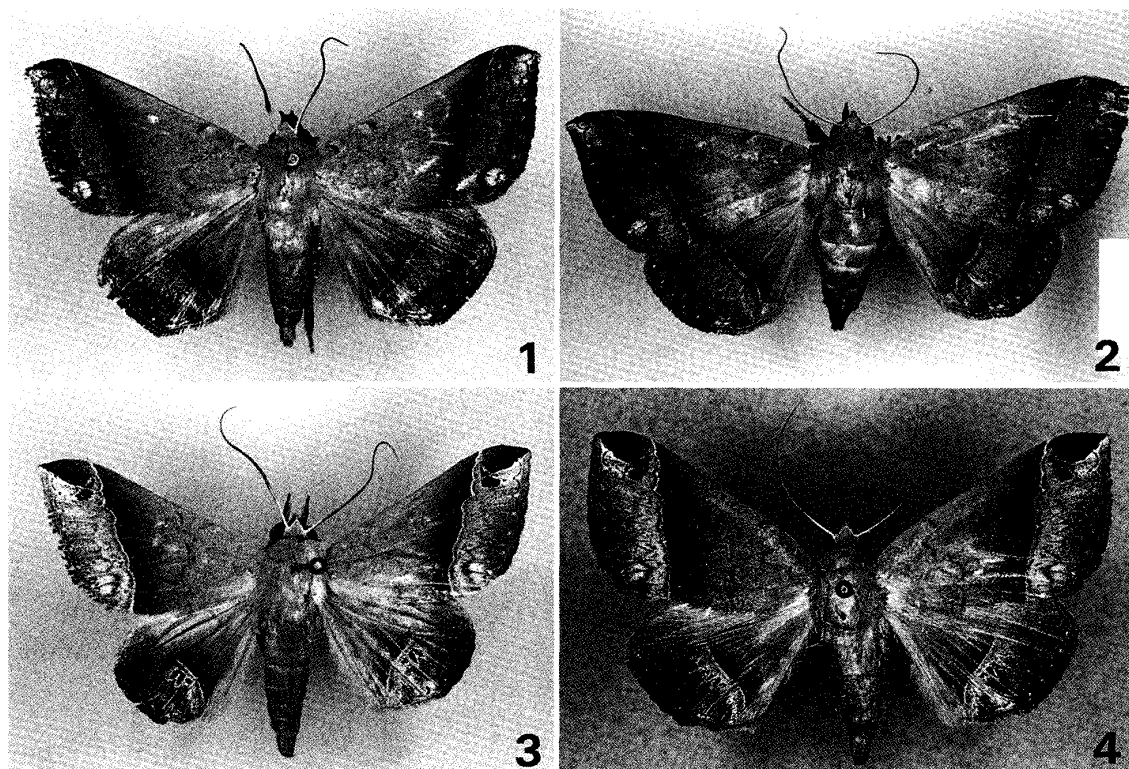
**Holotype.** ♂. [Malaysia] Genting Highlands, 1,000 m, vii. 1990 (coll. P. Butti), MCZ.

**Paratype.** 1 ♂. Malaya, Brinchang (J. L. C. Banks), NHM.

**Additional material examined.** [India] 1 ♂. Naga Hills, 5,000-7,000 ft, viii-ix.1889 (W. Doherty), NHM; 1 ♂, Khasis, v. 1895, NHM; 1 ♂, *ditto*, vi. 1895, NHM; 1 ♂, *ditto*, x. 189[5?], NHM. [Vietnam] 1 ♀, 'Cochin China', Nacham, vii. 1936 (S. Masseyeff), NHM.

Length of forewing 20-23 mm (holotype: 20 mm). Habitus of male and female closely corresponding with that of female *pangonia*. Head, thorax, and abdomen dorsally pale reddish brown, head and patagia sometimes yellowish; antennae dorsally pale yellowish beige, ventrally reddish brown. Basal and medial fields of forewing pale reddish brown, turning into dark brown toward postmedial; faint traces of thin brown subbasal; antemedial thin and brown, irregularly waved; orbicular a minute black dot; reniform reduced to two small circles, superior unscaled, inferior brown filled with pale reddish brown; postmedial double, dark reddish brown filled with pale lilac, straight, starting from well before apex, barely undulate superiorly; distal field lilac, internally bright, distally more dull-coloured; submarginal thin and brown, waved, with external small yellowish dots at interspaces; marginal line thin, yellowish; fringes brown. Apical spot absent or reduced to darkened area not extending below  $R_4$ ; subapical accessory spots missing. Some light grey suffusion close to distal margin in-between  $R_4$  and  $R_5$ , and  $CuA_1$  and 1A+2A. Hindwing basally and superiorly dull brownish, pale reddish brown below cubitus, turning into dark brown toward postmedial; postmedial double, extending from middle of disc to anal angle; distal field as in forewing, with faint traces of violet speckles distad from postmedial; fringes lighter at middle. Underside rather uniformly chocolate brown, darker markings represented by discal dots, postmedials and thin trait at reniform; marginal area lighter greyish, with small black dots at interspaces. Head, palps and legs dark brown, with some white speckles at tibio-femoral articulation on hindleg and spurs; thorax and abdomen chocolate brown.

**Male genitalia** (Figs 5-6). Armature *pangonia*-like, but less robust. Valva flimsy, particularly in distal half; costal process slender and pointed at apex, a little gibbous dorsally. Superior margin of juxta not deeply sclerotized, with V-shaped mesial incisure. Uncus long and slender. Aedeagus without dentate row of carinal spines, ending distally with pronounced thumb-like projection; vesica large, bearing conspicuous superior sack.



Figs 1-4. *Delgamma* spp. 1-2. *D. flaviae* sp. nov. (1. Holotype, ♂, Malaysia, Genting Highlands, MCZ. 2. ♀, Vietnam, Nacham). 3-4. *D. pangonia* (Guenée) (3. ♂, Genting Highlands. 4. ♀, Genting Highlands).

Female genitalia (Fig. 9). Armature *pangonia*-like. Ostium bursae not sclerotised; ductus bursae posteriorly sclerotized and barrel-shaped, anteriorly chitinous; bursa copulatrix elongate, approx. piriform. Apophyses thin, not dilated apically; posteriores nearly twice as long as anteriores. Ovipositor short. Sternum A7 regularly curved posteriorly, with small inflection at middle.

Etymology. The species is dedicated to my wife Flavia in recognition of her kind support and advice.

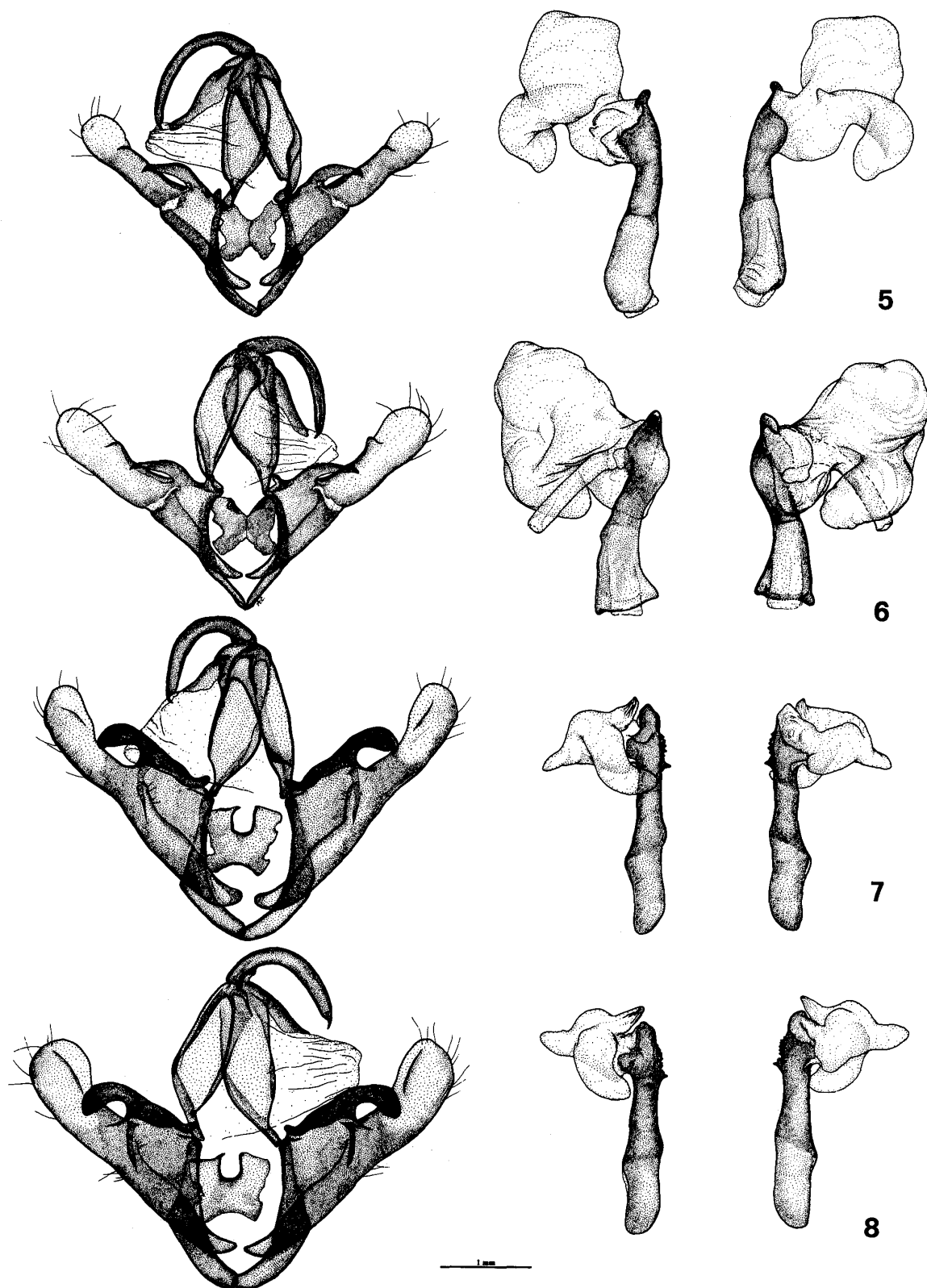
Geographical range. Indo-Malayan Peninsula, Assam.

Remarks. Due to the virtual absence of secondary sexual dimorphism in the new species, it is worth stressing its probable phylogenetic ancestry with respect to *D. pangonia* (Guenée, 1852).

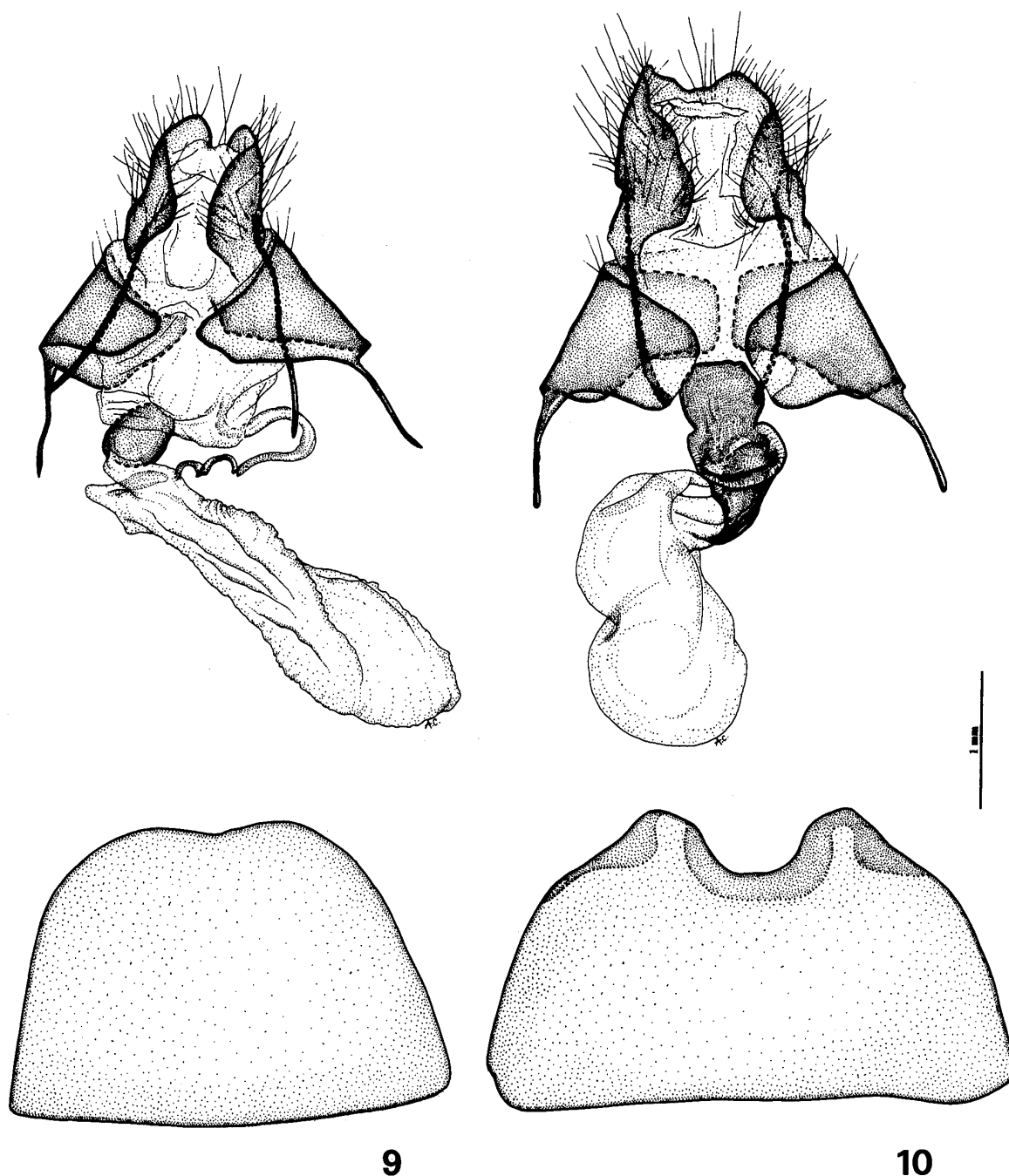
As dissection of one of the specimens from an area geographically more distant from the selected type locality revealed a few allomorphic differences in the shape of the aedeagus, which might be however well ascribable to geographic variability, it was decided to designate type material only from a restricted area.

#### Remarks on *Delgamma pangonia* (Guenée)

The opportunity of examining at the Natural History Museum of London a series of *D. pangonia* from the whole of its range, including type material of all the relevant nominal taxa, permits some remarks on present knowledge of the geographical variability of the species.



Figs 5-8. Male genitalia of *Delgamma* spp. 5-6. *D. flaviae* sp. nov. (5. Holotype, Malaysia, Genting Highlands, MCZ. 6. Assam, Khasis). 7-8. *D. pangonia* (Guenée) (7. Genting Highlands. 8. Vietnam, Tam Dao).



Figs 9-10. Female genitalia and sternum A7 of *Delgamma* spp. 9. *D. flaviae* sp. nov., Vietnam, Nacham. 10. *D. pangonia* (Guenée). Malaysia, Genting Highlands.

As put forward by Guenée (1852) himself, it is worth mentioning that the type locality of "*Bendis pangonia*", viz. 'Brésil?', is erroneous, the species having never been recorded from the Americas and Guenée's type specimen, a female, being fully characteristic of the Asian populations.

In fact, with the exception of specimens from Sri Lanka (=Ceylon), the upper part of the forewing postmedial is fairly waved in Asian material. This trait is reduced in populations from Sri Lanka and equatorial Africa, which therefore show a straighter line. In Sri Lankan specimens, moreover, the forewing is devoid of the accessory violet spots below the apical one

that occur in *pangonia* from other areas. This fact, illustrated by Moore (1885, in 1884–1887) in his illustration of “*Delgamma calorifica*” from Sri Lanka, was further stressed by Prout (1927) in the description of “*Delgamma sanctae*” from São Thomé in the Gulf of Guinea, as the specimens from this island share this feature with those from Sri Lanka. Walker’s (1858) type locality for “*Naxia calorifica*” is Silhet, Hindostan, Ceylon, and precedence should be therefore given to the first one. In the NHM collections a male syntype of *calorifica* from ‘Silhet’ and a female one labelled ‘N. India’ are present (*cf.* Nye, 1975), both of which are fully consistent with the current concept of *pangonia*. In any case, also the traits of a male specimen from Sri Lanka (BMNH Noctuid slide 16515) are consistent with *pangonia* (*e. g.* elongate hyaline area on hindwing, distally incrassate costal process of valva, U-shaped incisure of juxta, configuration of vesica, presence of dentate carina, etc.), and some allomorphic differences in the relevant sizes of the vesica swellings with the specimens here figured can be comfortably put down to geographic variability.

Of the two female syntypes of *Delgamma sanctae*, only that one figured by Prout (1927) was traced. This specimen is rather dull-coloured and, as usual for the African populations, shows a straighter forewing postmedial, and a shorter one at the hindwing, *i. e.* not extending beyond the middle of the disc (*cf.* Gaede, 1934–1940). Moreover, there is no trace of the accessory subapical spots on the forewing, a character which is therefore shared with the Sri Lankan populations. On the contrary, the emphasis laid by Prout (1927) on the complete absence of speckles beyond the hindwing postmedial does not seem justified, as this feature is subject to considerable variation within *pangonia*. Current evidence does not support the view of the São Thomé population as substantially different from those of mainland Africa, although the congruence in some traits of the habitus with those of Sri Lanka undoubtedly represents a bizarre circumstance.

### Acknowledgements

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## 摘 要

*Delgamma pangonia* と近似の 1 新種について (Alberto Zilli)

ヤガ科クチバガ亜科の *Delgamma pangonia* (Guenée) は、熱帯アフリカから熱帯アジア、オーストラリアにかけて広く分布する中型種で、やや顕著な性的二型を示し、♂は前翅が幅細く、後翅前方には鱗粉の発達が悪い淡色部が広がる。ところが、ローマの動物学博物館 (Museo Civico di Zoologia, Rome=MCZ) に所蔵されるこの群の標本整理中、まるで♀のような顔をしたマレーシア産の♂があることに気付いた。ロンドン自然史博物館に問い合わせたところ、同館にもマレーシア、インド、ベトナム産のこれに該当する 5 ♂ 1 ♀ の標本の保管されることを知り、これらを詳しく調べた結果、新種であることが分かったので記載した。新種 *Delgamma flaviae* Zilli (Figs 1-2) では、前翅外横線はより直線的で、翅頂部には *D. pangonia* (Figs 3-4) に見られるような暗色紋を伴わず、♂では後翅の性斑もほとんど発達しない。分布はインド・アッサム地方とインドシナ半島で、*D. pangonia* と混棲する。

なお、この機会にロンドン自然史博物館で調査した *Delgamma pangonia* についても記した。Guenée (1852) による *pangonia* の模式産地 “Brésil?” は明らかに誤りで、模式標本 (♀) はアジア産である。スリランカと赤道アフリカの *pangonia* は、前翅外横線が前方で波状とならずより直線的で、さらにスリランカ産では翅頂部の暗色紋の下の小紫紋も消失する。この特徴は、Moore (1895) によるスリランカ産の標本の図にも示され、また今日 *pangonia* のシノニムとされるアフリカ西部ギニア湾サントメ島の *D. sanctae* A. E. Prout, 1927 の記載中でも強調された。*D. pangonia* の別のシノニムの *calorifica* Walker, 1858 は、シレット、ヒンドウスタン、スリランカの標本に基づくが、シレット産の♂ syntype と北インド産の♀ syntype はともにアジア顔であった。しかし、スリランカ産の♂は交尾器および後翅の性斑などではアジアの *pangonia* と一致するので、これらは別種ではなく、地理的変異とみなすのが相当である。*D. sanctae* については Prout (1927) に図示された syntype 1 ♀ を調べたが、本質的にはアフリカ大陸本土産と区別するだけの根拠が得られなかった。

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